The new (?) agronomy and new (?) research methods

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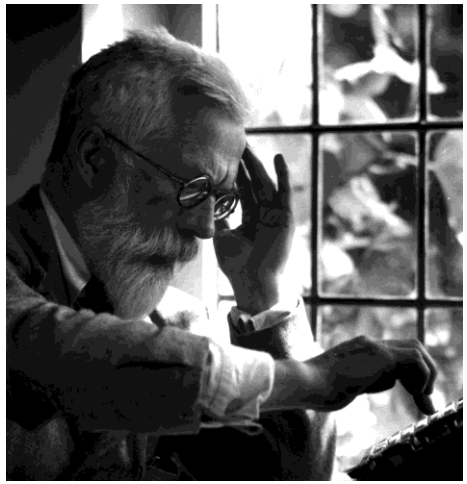
World Agroforestry Centre (ICRAF)
Africa RISING training on participatory research methods
3 - 4 October, 2016
Lilongwe, Malawi

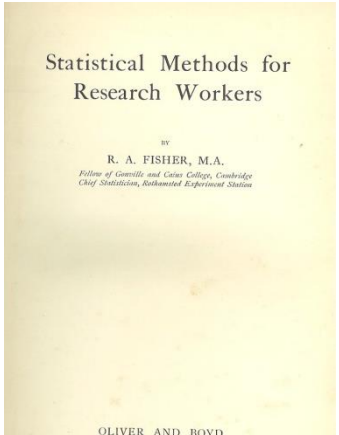
The first 150 years



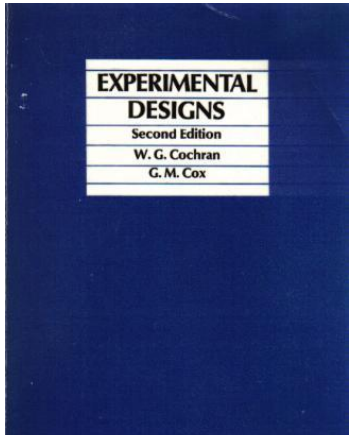
?

1850

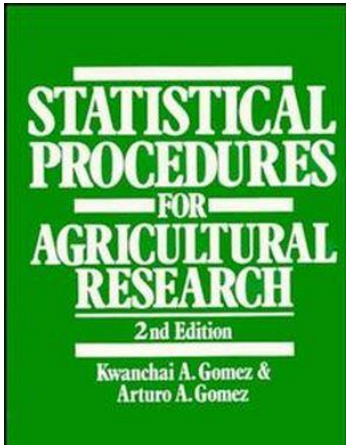
1925



1957



1990



2016

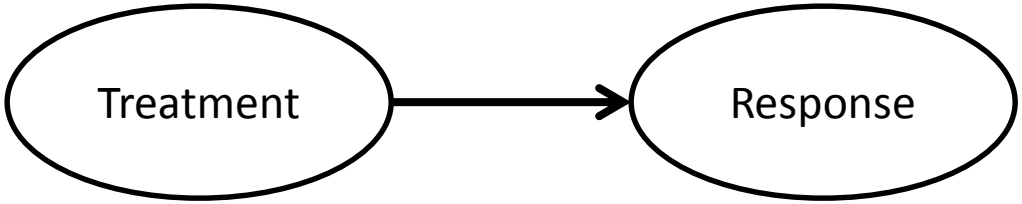
Conceptual frame ⇒ methods

- There is 'a treatment effect' to be estimated
  - Get a precise and unbiased estimate
- Variation around the effect is 'error'
  - Control as much as possible
  - Replicate and average to reduce impact of the variation

⇒ Do a 'Fisher-type' randomised experiment.

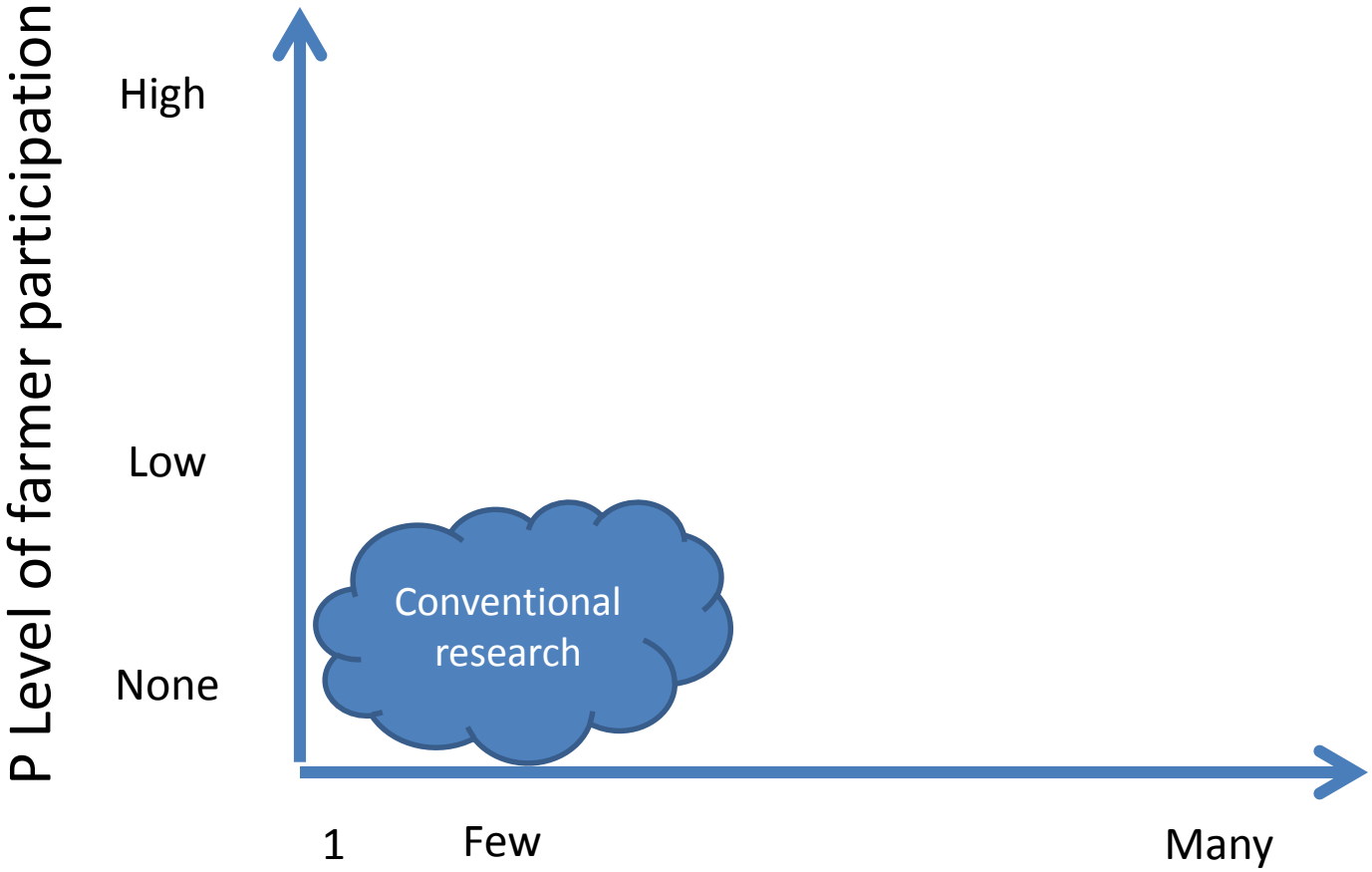
- The effect may depend on an environment factor (eg soil type)

⇒Do a MET in a small number of environments



Much of what we know in agronomy was discovered or confirmed with these methods – they are pretty good!

The N x P space of research methods



N number of sites/participants

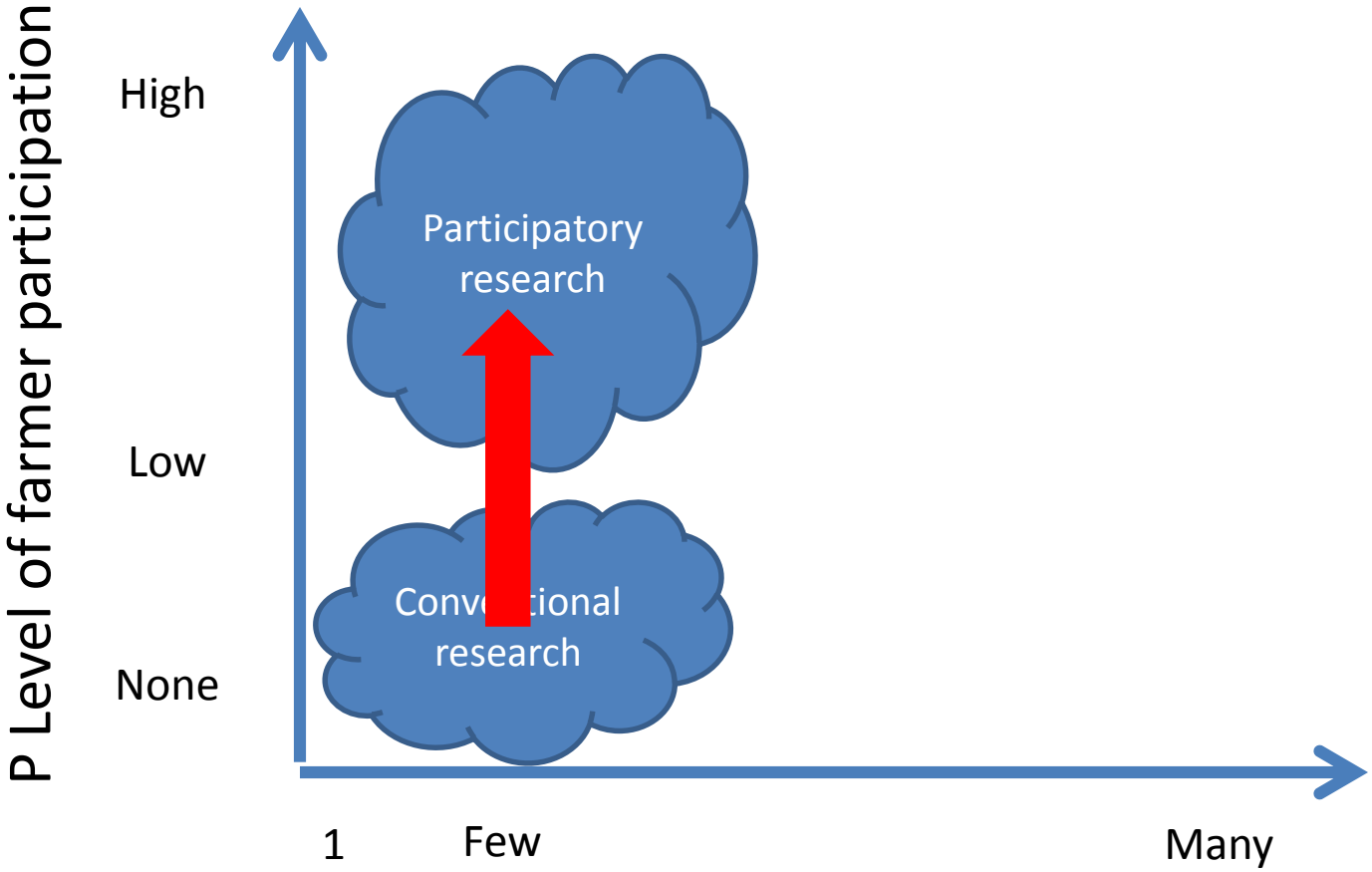
≈c exp(number of environment/context factors)

Implications of systems approach 1: integrating social and biophysical

- Social responses (farmer's assessments and options) in addition to biophysical

⇒ Participatory experimentation

The N x P space of research methods



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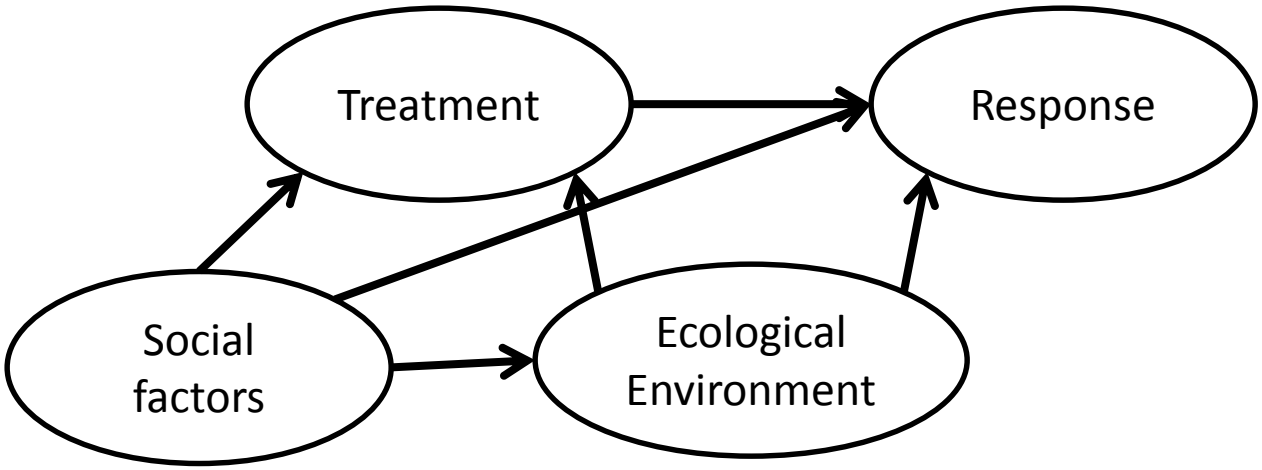
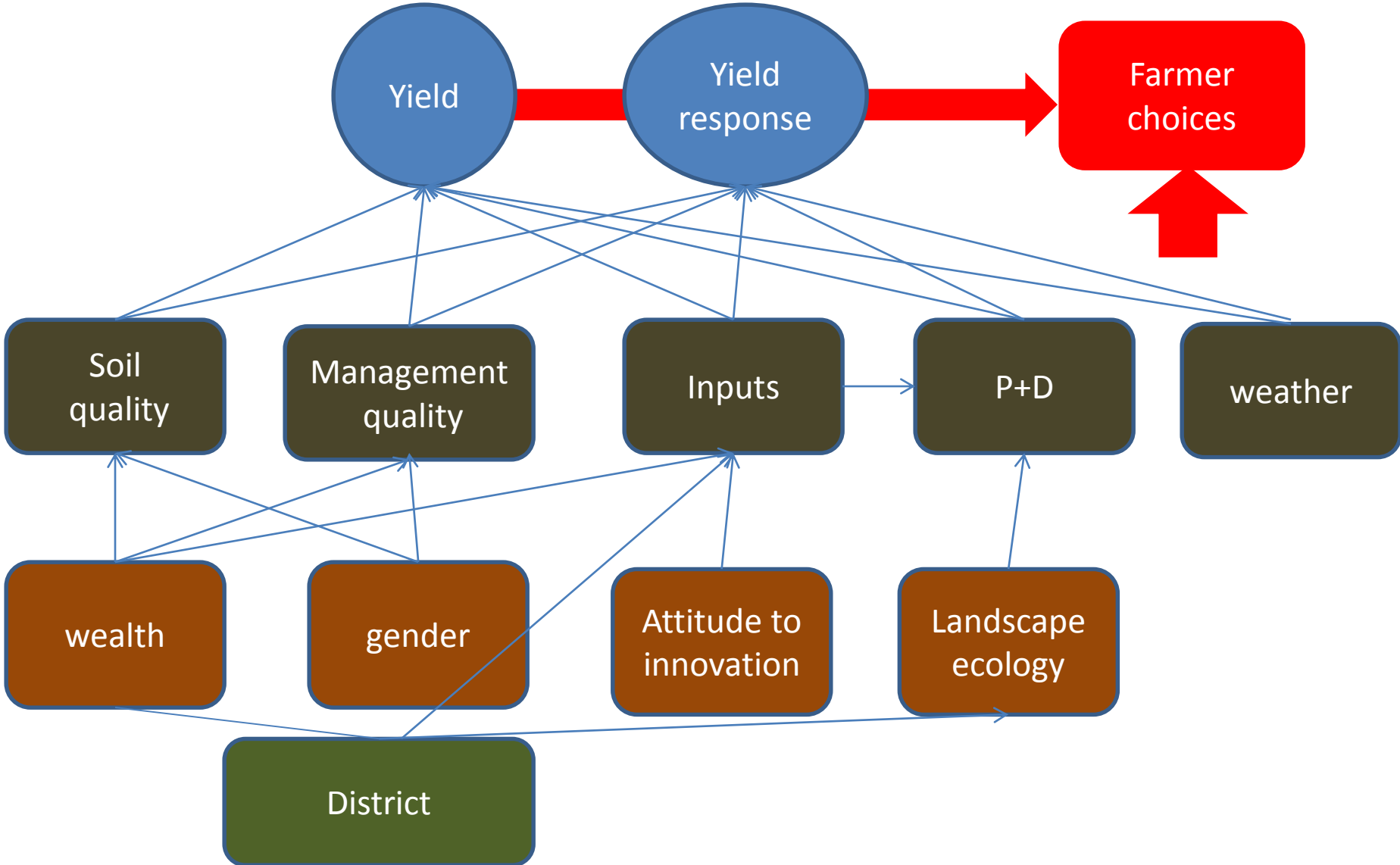
Implications of systems approach 1: integrating social and biophysical

- More complex influence diagrams



Malawi legumes example



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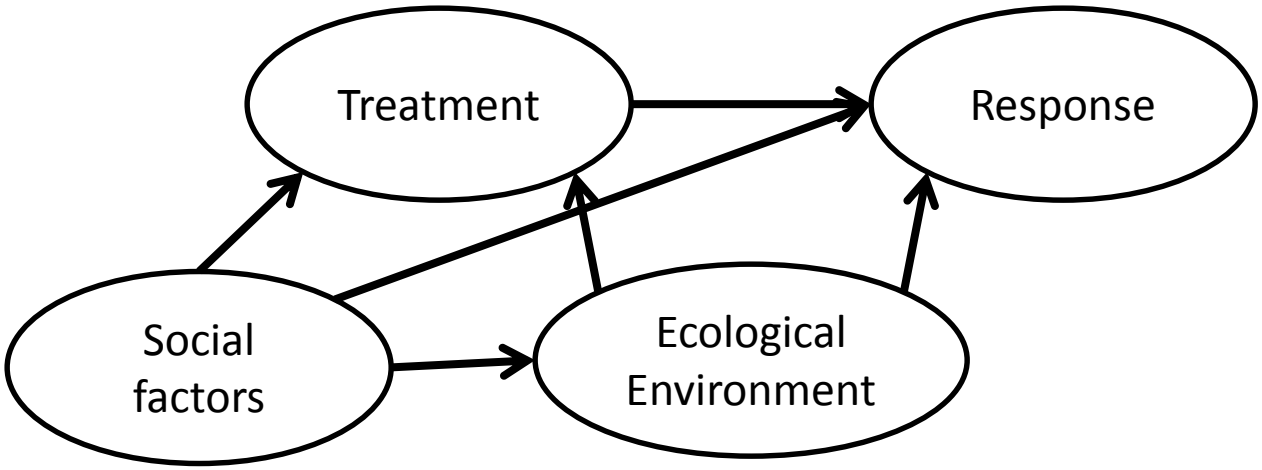


⇒

- Merge survey and experimental methods [De Datta et al 1978]
- Use qualitative and quantitative methods as appropriate

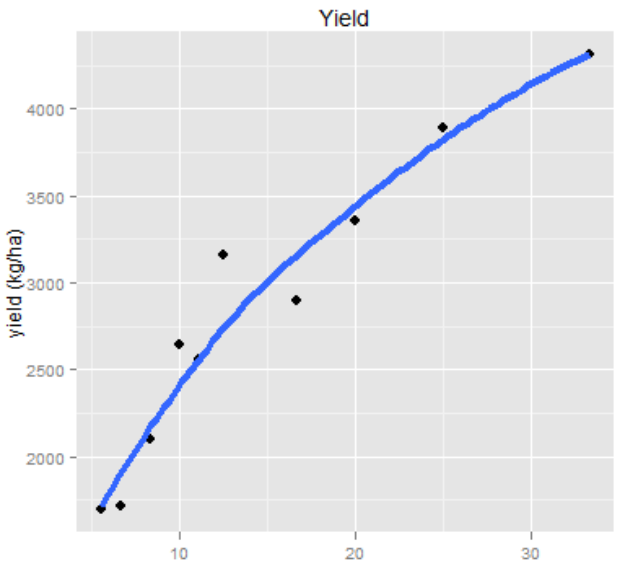
Implications of systems approach 2: recognise OxC interactions

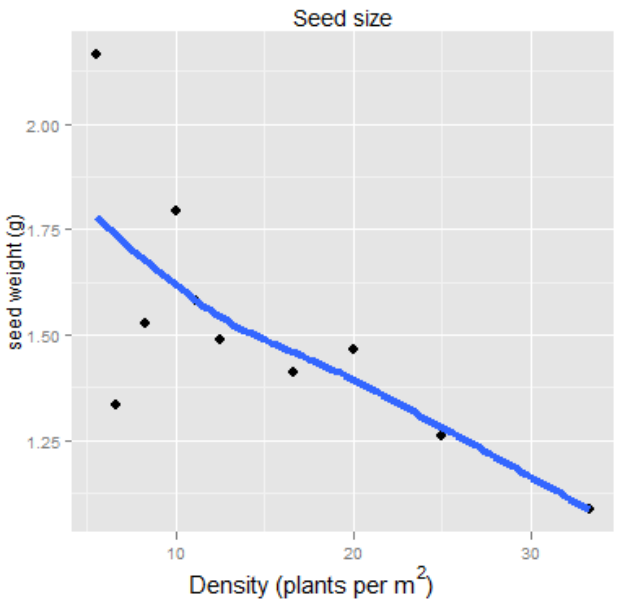
- Options always interact with Socio-ecological context
  - No ‘one size fits all’
  - Few optima to discover
  - Information on alternatives and tradeoffs rather than recommendations

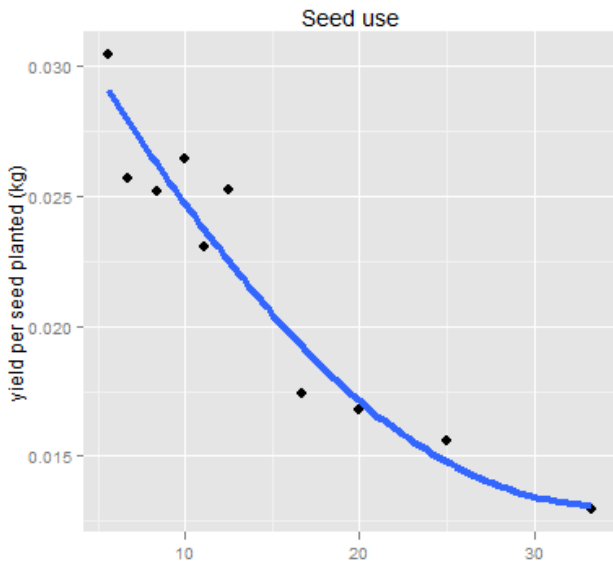
⇒

- Plan METs that sample the heterogeneity of contexts
- Measure responses that matter
- Analyse data to focus on interactions and tradeoffs.

Bambara spacing







Who assesses the trade-off?

Agronomist ⇒ implicit choices in design and analysis

Economist ⇒ choices of values and utility

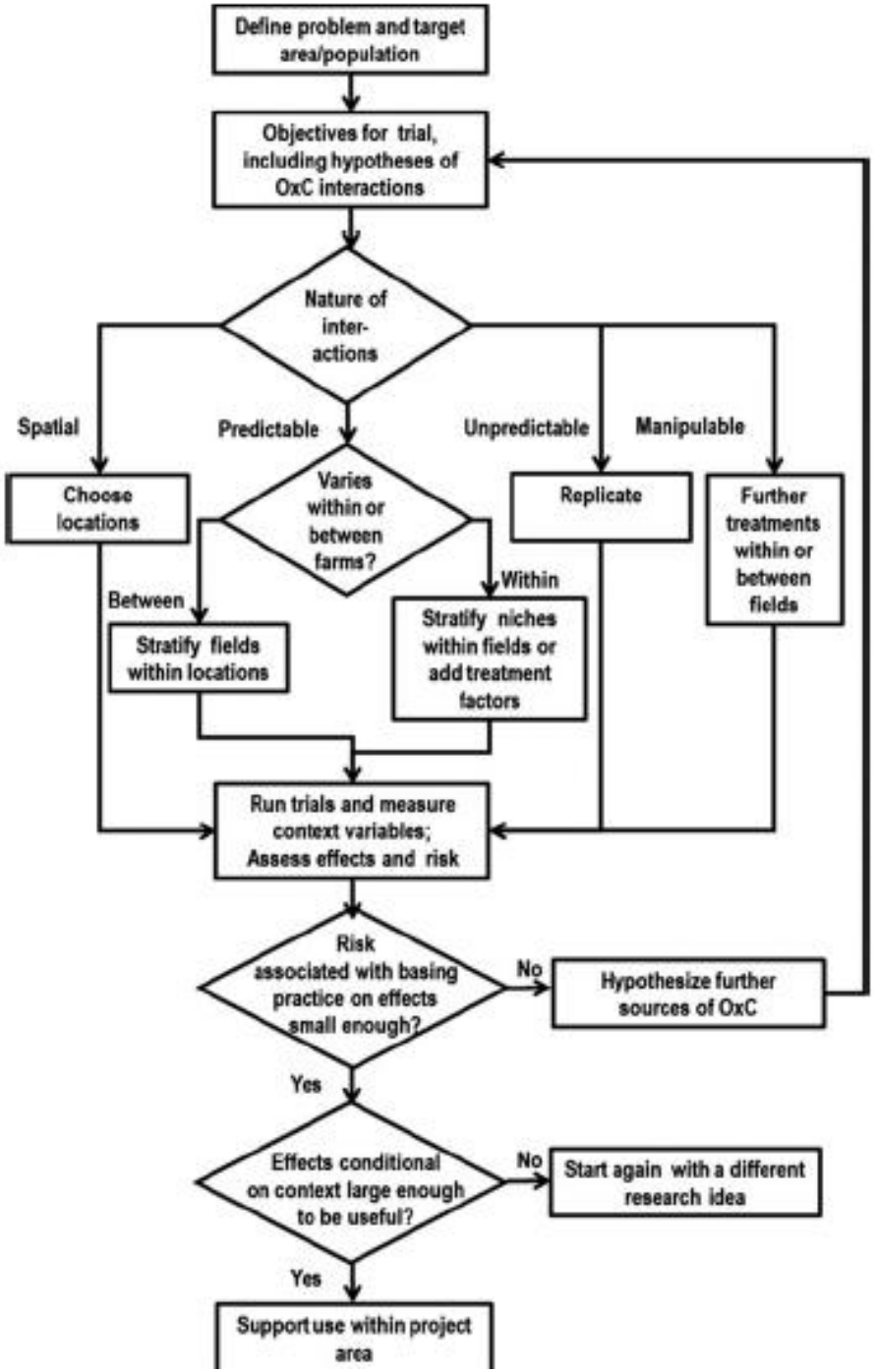
Farmer ⇒ concentrate on proving information in useful way

Implications of systems approach 3: beyond means – risk and variation

- Uncertainty will always be there
- Quantify it
- Make it part of the message

⇒

- Use sufficient N to estimate variation and risk.
- Use analysis methods that present and interpret variation as well as means



Planning effective METs

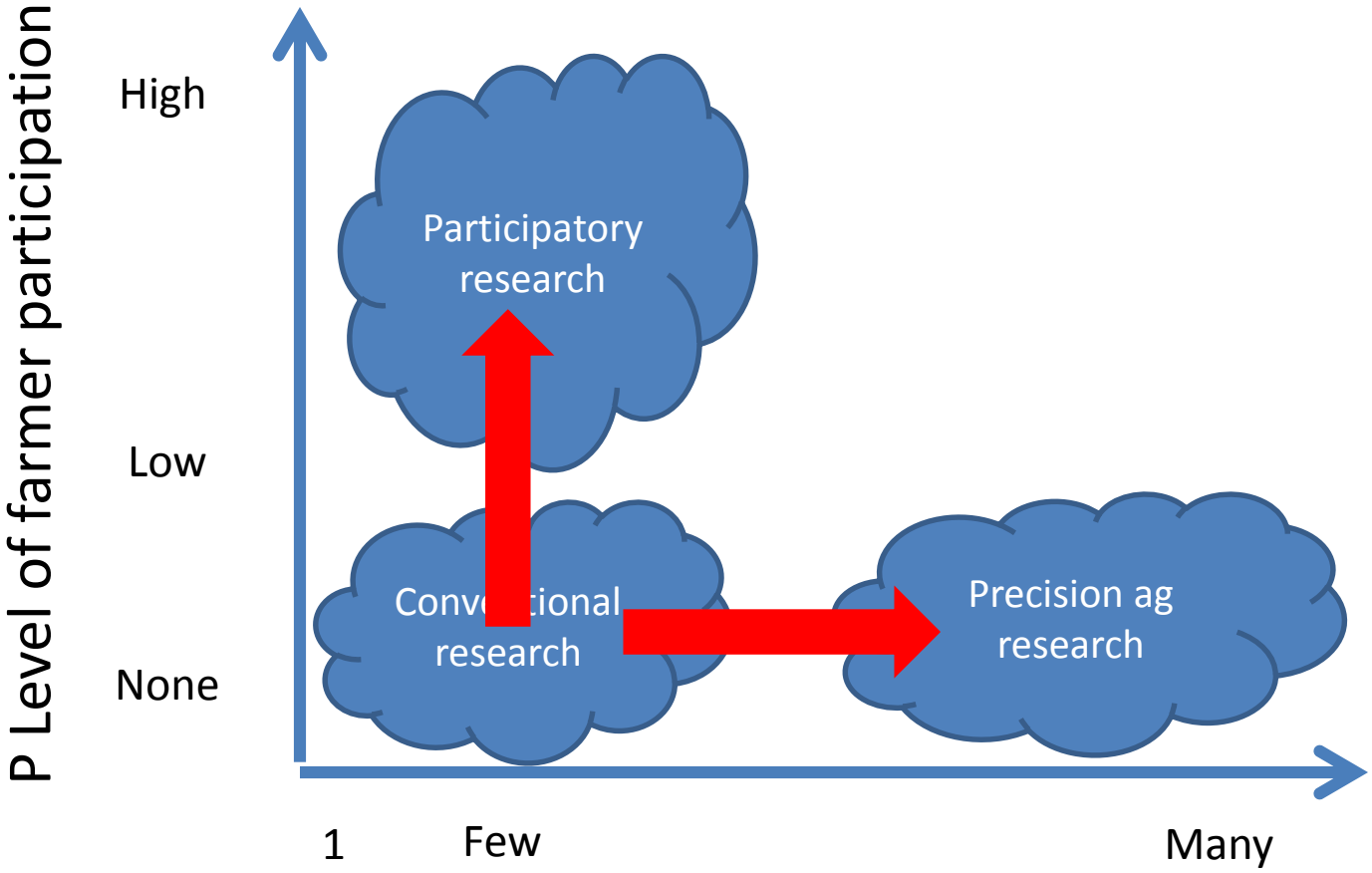
Hypotheses of important factors

Classify:

- Manipulable
- Spatial
- Predictable
- Unpredictable

[Vanlauwe, Coe and Giller 2016]

The N x P space of research methods



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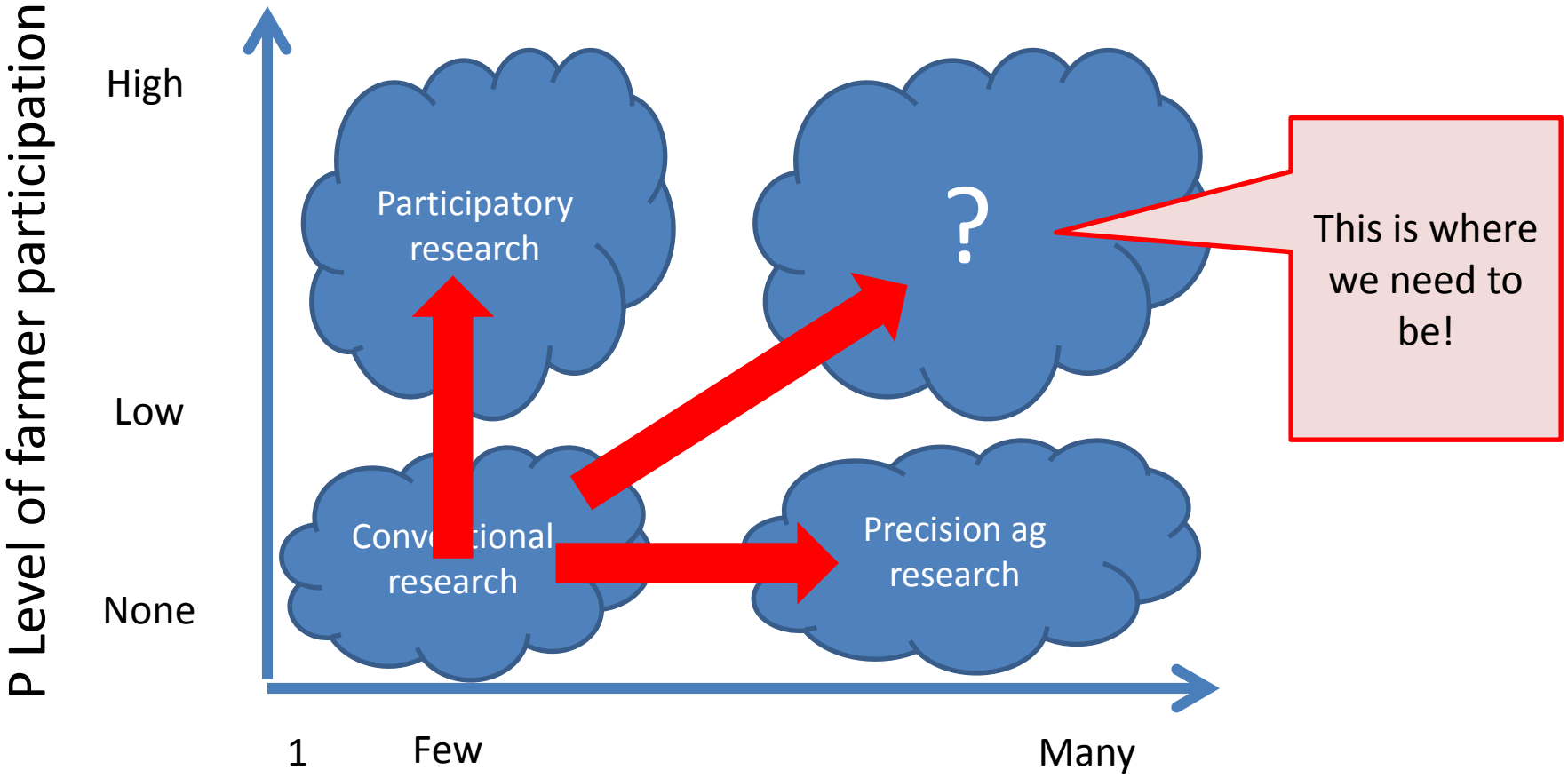

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Implications for methods

Often (not always):

- Large N participatory trials
  - scaling benefits
- Driven by hypotheses based on system understanding
- Design implications – simplicity, flexibility
- Organisational implications - crowd source, R in D, FRN,…